What is claimed is:

1. A coherent nonwoven dimensionally stable fibrous web comprising directly formed elastic fibers that have a molecular orientation sufficient to provide a birefringence number of at least 1×10^{-5}.

2. A web of claim 1 in which said directly formed elastic fibers have a molecular orientation sufficient to provide a birefringence number of at least 1×10^{-2}.

3. A web of claim 1 in which the elastic fibers comprise ethylene-based polymer and the fibers exhibit a birefringence number of at least 1×10^{-2}.

4. A web of claim 1 in which the elastic fibers comprise propylene-based polymer and the fibers exhibit a birefringence number of at least 1×10^{-2}.

5. A web of claim 1 in which the elastic fibers comprise urethane-based polymer and the fibers exhibit a birefringence number of at least 1×10^{-2}.

6. A web of claim 1 in which the elastic fibers comprise a styrenic block copolymer.

7. A web of claim 1 in which the elastic fibers comprise aliphatic polyester or aliphatic polyamide.

8. A web of claim 1 that has been annealed by heating the elastic fibers above their shrinking temperature while retaining said molecular orientation sufficient to provide a birefringence number of at least 1×10^{-5}.

9. A web of claim 1 that exhibits a shrinkage in width of no more than 10% when heated to 70 °C.

10. A web of claim 1 in which the elastic fibers exhibit an elongation to break of at least 200 %.

11. A web of claim 10 in which the elastic fibers have sufficient elastic recovery that when released from tension stretching them to twice their original length they will retract to no more than one-and-one-fourth their original length.

12. A web of claim 11 in which the elastic fibers exhibit a birefringence number of at least 1×10^{-2}.

13. A web of claim 1 in which the elastic fibers have been thermally bonded.

14. A web of claim 13 in which the bonds comprise autogenous bonds.

15. A web of claim 1 in which the fibers of the web have been hydroentangled to mechanically bond the fibers.

16. A web of claim 1 in which the elastic fibers exhibit strain-induced crystallization.

17. A coherent nonwoven dimensionally stable fibrous web comprising directly formed elastomeric fibers that have a molecular orientation sufficient to provide a birefringence number of at least 1×10^{-2}.

18. A web of claim 17 in which the elastomeric fibers comprise an ethylene-based or propylene-based polymer.

19. A web of claim 17 in which the elastomeric fibers have been annealed and subsequently bonded while retaining said molecular orientation sufficient to provide a birefringence number of at least 1×10^{-2}.

20. A web of claim 17 in which the elastomeric fibers exhibit strain-induced crystallization.

21. A fiber-forming method comprising a) extruding filaments of elastic-fiber-forming material; b) directing the filaments through a processing chamber in which a longitudinal stress is applied to the filaments that attenuates and draws the filaments; c) maintaining the filaments at their orienting temperature while the filaments are under attenuating and drawing stress for a sufficient time for molecules within the filaments to become oriented along the length of the filaments; d) cooling the filaments to their orientation-locking temperature while the filaments are under attenuating and drawing stress and further cooling the filaments to solidified elastic fibers; and e) collecting the solidified elastic fibers as a fibrous nonwoven web.

22. A method of claim 21 in which the filaments enter the processing chamber at a temperature higher than the glass transition temperature or melting point of the filaments.

23. A method of claim 21 in which the largest longitudinal stress is applied to the filaments after they leave the processing chamber.

24. A method of claim 22 in which the largest longitudinal stress is applied to the filaments after they leave the processing chamber.

25. A method of claim 21 in which the filaments pass through the processing chamber at a rate of at least 2800 meters/minute.

26. A method of claim 22 in which the filaments pass through the processing chamber at a rate of at least 2800 meters/minute.

27. A method of claim 24 in which the filaments pass through the processing chamber at a rate of at least 2800 meters/minute.

28. A method of claim 21 in which the filaments pass through the processing chamber at a rate of at least 4000 meters/minute.

29. A method of claim 21 including the further step of annealing the collected fibers by exposing them to a temperature that is above their shrinkage temperature but less than the relaxation temperature of the fibers.

30. A method of claim 21 including the further step of thermally bonding the fibers after they have been annealed.

31. A method of claim 21 in which the collected fibers of the nonwoven web exhibit an elongation to break of at least 200 percent.

32. A method of claim 21 in which the filaments comprise an ethylene-based polymer or a propylene-based polymer.

33. A method of claim 21 in which the filaments comprise a urethane-based polymer.

34. A method of claim 21 in which the filaments comprise a styrenic block copolymer.

35. A method of claim 21 in which the filaments comprise an aliphatic polyester or an aliphatic polyamide.

36. A method for preparing a fibrous web comprising 1) preparing extruded filaments from an elastic-fiber-forming liquid, 2) processing and attenuating the extruded filaments to solid collectible fibers having molecular orientation, 3) collecting the fibers as a nonwoven web, 4) annealing the collected fibers by exposing them to a temperature that is above their shrinking temperature but less than their relaxation temperature to make the

web dimensionally stable while retaining sufficient molecular orientation that the fibers exhibit a birefringence of at least 1 x 10^{-5}, and 5) bonding the web to give it increased coherency.

37. A method of claim 36 in which step (4) is performed after step (5).

38. A method of claim 37 in which bonding of the web in step (5) comprises hydroentangling the web.

39. A method of claim 36 including the further step of thermally bonding the fibers after they have been annealed.

40. A method of claim 36 in which the filaments are processed and attenuated by passing the filaments through a processing chamber at a rate of at least 2800 meters/minute.